



Faculty of Cognitive Sciences and Human Development

**SECONDARY STUDENTS' PERCEPTIONS OF THE
IMPORTANCE, DIFFICULTY, INTEREST AND
ENGAGEMENT IN LEARNING BIOLOGY**

Chan Chiew Wair

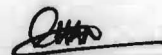
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5th June 2015

(Date submitted)



Chan Chiew Wair
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**SECONDARY STUDENTS' PERCEPTIONS OF THE IMPORTANCE, DIFFICULTY,
INTEREST AND ENGAGEMENT IN LEARNING BIOLOGY**

CHAN CHIEW WAIR

A dissertation submitted in partial fulfillment of the requirements for the degree of
Master of Science (Learning Sciences)

Faculty of Cognitive Sciences and Human Development

UNIVERSITI MALAYSIA SARAWAK

2015

The research paper “ Secondary Students’ Perceptions of the Importance, Difficulty, Interest and engagement in learning Biology” was prepared by *Chan Chiew Wair* and submitted to the Faculty of Cognitive Sciences and Human Development in partial fulfillment of the requirements for Master of Science with Honours (*Learning Sciences*)

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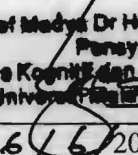
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ABSTRACT

This study aims to provide a glimpse of Malaysian secondary school students' perceptions on biology content, their importance, difficulties, interests and engagement in learning. Biology is a subject that has often been considered as difficult by students. Biology contents refer to the topics that students learned according to the curriculum. Based on previous studies, there has been a decline in interest in learning science, including Biology in many countries. Therefore, this study highlighted students' perceptions toward biology content from the aspect of importance, difficulties, interests and engagement in learning, as well as exploring a possible gender difference in their attitudes. A questionnaire was used to measure students' perceptions on the importance, difficulty, interest and engagement in learning biology content of 356 form five students in the district Sibul, Sarawak, Malaysia. Results showed that the secondary students perceived importance for all the topics in form four biology content. In addition, the findings indicated that they found the content as moderately difficult. Nonetheless, the students found learning biology moderately interesting. There was a positive relationship between student engagement in learning and perceptions of the importance, as well as an interest in learning biology content. However, there was a negative relationship between student engagement in learning and perceptions of the difficulty in learning biology. Gender did not have an impact on students' perceptions of the importance, difficulty, interest and engagement in learning biology content.

Keywords: *Biology contents, importance, difficulty, interest, engagement in learning*

ABSTRAK

Kajian ini bertujuan untuk memberi gambaran tentang pandangan pelajar sekolah menengah di Malaysia mengenai kandungan biologi, kepentingan, kesukaran, minat dan penglibatan pelajar dalam pembelajaran. Biologi adalah satu mata pelajaran yang sering dianggap sukar di kalangan pelajar. Kandungan biologi merujuk kepada topik yang pelajar pelajari mengikut kurikulum. Berdasarkan kajian lepas, terdapat penurunan minat terhadap pembelajaran sains, termasuk Biologi di banyak negara. Oleh itu, kajian ini menunjukkan persepsi pelajar terhadap kandungan biologi dari segi kepentingan, kesukaran, minat dan penglibatan dalam pembelajaran serta meneroka kemungkinann wujud perbezaan jantina dalam sikap mereka. Soal selidik digunakan untuk mengukur persepsi mengenai kepentingan, kesukaran, minat dan penglibatan dalam pembelajaran kandungan biologi di kalangan seramai 356 orang pelajar tingkatan lima di daerah Sibul, Sarawak, Malaysia. Hasil kajian menunjukkan bahawa pelajar-pelajar menengah mempunyai persepsi bahawa semua topik dalam kandungan biologi tingkatan empat adalah penting. Selain itu, dapatan kajian menunjukkan bahawa mereka mendapati kandungan biologi tersebut sebagai sederhana sukar. Namun, mereka mendapati pembelajaran biologi agak menarik. Terdapat hubungan yang positif antara penglibatan pelajar dalam pembelajaran dan persepsi kepentingan serta kepentingan dalam kandungan pembelajaran biologi. Walau bagaimanapun, terdapat hubungan negatif antara penglibatan pelajar dalam pembelajaran dan persepsi kesukaran untuk belajar kandungan biologi diturunkan. Jantina tidak memberi sebarang kesan kepada persepsi pelajar terhadap kepentingan, kesukaran, minat dan penglibatan dalam pembelajaran kandungan biologi.

Kata kunci: *Kandungan biologi, kepentingan, kesukaran, minat, penglibatan dalam pembelajaran*

CHAPTER 1

INTRODUCTION

1.0 Introduction

This chapter provides an overview of the study and consists of the background of the study, problem statement, research objectives, research questions, research hypotheses, research framework, the significance of the study, limitations of the study and definition of terms.

1.1 Background of study

Since decades ago, most developing countries in the world have been aware of the importance of science and technology in science education, and thus a lot of resources and funding had been put into encouraging the teaching and learning of science in secondary schools (Olundare & Oni, n.d.; Osborne & Dillon, 2008). Moreover, Sjøberg, (2002) claimed that knowledge and skills in science and technology are important for humans' actions and decisions especially in their chosen profession. Therefore, scientific literacy is an essential constituent enabling learners to think, evaluate, make decisions and also develop a proper attitudes toward learning (Bahri, Suryawati, & Osman, 2014).

In Malaysia, the national educational system places importance in science with its inclusion in the school curriculum, right from the primary to tertiary levels in Malaysian schools and institutions of higher learning (Ministry of Education Malaysia, 2012). Biology is one of the three pure science subjects in the Malaysian upper secondary school syllabus. According to the Curriculum Specifications of the Integrated Curriculum for Secondary Schools (Ministry of Education Malaysia, 2005), the aims of the biology curriculum for secondary school are to provide students with the knowledge and skills in science and technology and enable them to solve problems and make decisions in everyday life based on scientific attitudes and noble values. Students who have followed the biology curriculum will have the foundation in biology to enable them to pursue formal and informal further education in science and technology. The curriculum also aims to develop a concerned, dynamic and progressive society with a science and technology culture that values nature and works towards the preservation and conservation of the environment (Ministry of Education Malaysia, 2005).

However, students' interest in science education in schools had dropped to a critical level as reported by the Malaysian Higher Education Minister (*Declining interest in science education alarming*, 2012). This lack of interest in science might have a negative effect on the government efforts to improve technological innovations and make Malaysia a high income country. Past studies have also claimed that the above phenomenon occurred globally. For example, according to Dawson (2000), interest in science had decreased in South Australia between 1980 and 1997. In addition, Osborne, Simon and Collins (2003) reported the number of students that took A-level exam for the three science subjects of biology, chemistry and physics in England had dropped from the year 1990 to 2000.

Furthermore, according to studies conducted overseas (Chuang & Cheng, 2003; Çimer, 2012; Ozcan, Ozgur, Kat, & Elgun, 2014) and locally (Buhari, 2000; Lee, 1998) students' attitudes toward biology could significantly affect their achievement in biology. Therefore, understanding students' attitudes is important in supporting their achievement and interest towards learning biology. Students' attitudes toward science and in particular biology have been investigated by many researchers. Dhindsa and Chung (2003), and Osborne et al. (2003) studied students' attitudes toward science while Prokop, Tuncer, and Chuda, (2007) investigated students' attitudes toward biology.

In addition, past studies have also explored students' difficulties in learning biology concepts. Lazarowitz and Penso (1992) reported that high school students have learning difficulties in biology concepts such as cell, organelles, organs, and physiological processes, hormonal regulation, oxygen transport, controlled experiments and the principle of structure and function. In 1999, Bahar, Johnstone and Hansell found that Scottish first year university students perceived the genetic topics as one of the most difficult topics.

Educators have been trying to provide a better education to youth for a better future. A better education also lies in motivating students and involving them in the learning process. Marchaim (2001) states that developing individual creativity lies at the heart of continuous innovation, and encouraging students to use this skill in shaping their lives should be the foremost goal of today's education.

1.2 Problem Statement

Based on personal experiences as a biology teacher in a secondary school and past

literature (e.g., Ogunkola & Samuel, 2011; Osman, Hiong & Vebrianto, 2013), issues such as poor performance in science, low enrollment in science courses at the upper secondary and tertiary levels, as well as poor interest and attitudes to science have overwhelmed the education systems of many countries for decades. Previous studies have generally indicated that variables such as students' attitudes, conceptions, perceptions, interest, difficulty and goals in science (Ballard, 2007; Mavrikaki, Koumparou, Kyriakoudi, Papacharalampous, & Trimandili, 2012) contributed to the decline in student's studying biology.

Biology is one of the elective science subjects that Malaysian secondary school students study when they enrol into the science stream. Once the students are following the biology curriculum in secondary school, it becomes a passport for them to further their study in tertiary education for science and technology courses. However, students commented that biology is hard to study and it is difficult to obtain good scores in examinations. According to Jabu K. (personal communication, March 30, 2015), the Malaysian Examination Board (Lembaga Peperiksaan Malaysia, 2010-2013) reported that comparatively, the number of students obtaining A+ in biology subject was the least compared to chemistry or physics in public examination such as the Malaysian Certificate of Education (Sijil Pelajaran Malaysia, SPM).

Many factors could have caused students to have difficulty coping with Biology, especially in understanding concepts. In addition, students have always voiced out their disinterest to study biology and they are not aware of the importance of studying biology in their daily life. Therefore, this study focuses on students' perceptions of biology content from the aspect of importance, difficulty, interest and engagement in learning. Moreover,

past studies showed that researchers, educators, and policymakers have increasingly emphasized on student engagement as it was a key to address the problems of low achievement, student boredom and alienation, and high dropout rates (Fredricks, Blumenfeld, & Paris 2004). Student engagement has become an important factor related to multiple educational outcomes such as achievement, attendance, behavior and completion (Hart, Stewart, & Jimerson, 2011).

Although there are past studies on students' attitudes towards science or specifically in biology, most of these studies were carried out overseas. Therefore, a study of students' perceptions of the biology content studied at local secondary schools has great significance to enrich the literature especially for local teachers and researchers.

1.3 Research Objectives

1.3.1 General Objective

The main aims of the study were to identify secondary level students' perceptions on biology contents and the perceived level of importance, difficulty, interest and engagement in learning biology.

1.3.2 Specific Objectives

The specific objectives of the study were:

- 1) To determine students' perceptions of importance of biology contents.
- 2) To determine students' perceptions on degree of difficulty of biology contents.
- 3) To determine students' perceptions on their interest in learning biology contents.

- 4) To determine students' perceptions of their level of engagement in learning biology contents.
- 5) To determine the relationships between students' perceptions of engagement in learning and importance, degree of difficulty and interest in learning biology content.
- 6) To determine differences in students' perceptions of importance, degree of difficulty, interest in learning, and engagement in learning and biology content based on gender.

1.4 Research Questions

Therefore, this study attempted to answer the following research questions:

RQ1: What were students' perceptions on degree of importance of biology contents?

RQ2: What were students' perceptions on degree of difficulty of biology contents?

RQ3: What were students' perceptions on their interest in learning biology contents?

RQ4: What were students' perceptions on their level of engagement in learning biology contents?

RQ5: Was there any significant relationships between students' perceptions of engagement in learning and importance, degree of difficulty and interest in learning biology content?

RQ6: Was there any significant differences in students' perceptions of importance, degree of difficulty, interest in learning, and engagement in learning and biology content based on gender?

1.5 Research Hypotheses

- Ho1: There were no significant relationships between the students' perceptions of the importance of biology content and engagement in learning.
- Ho2: There were no significant relationships between the students' perceptions of difficulty of biology content and engagement in learning.
- Ho3: There were no significant relationships between the students' perceptions of interest in learning biology content and engagement in learning.
- Ho4: There were no significant differences in the students' perceptions on the importance of biology content based on gender.
- Ho5: There were no significant differences in the students' perceptions on the degree of difficulty of biology content based on gender.
- Ho6: There were no significant differences in the students' perceptions on the interest in learning biology content based on gender.
- Ho7: There were no significant differences in the students' perceptions on the engagement in learning biology content based on gender.

1.6 Research Framework

The purposes of this study were to determine the students' perception of the biology content in the context of important, difficulty, interest and engagement in learning biology. Figure 1.1 showed the independent and dependent variables of this study. The independent variables were the biology content which consisted of degree of importance, degree of difficulty, degree of interest and gender. The dependent variable for this study was engagement in learning.